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# **1983 Environmental Accident Statistics**

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**Manitoba  
Environment  
and Workplace  
Safety and Health**



## 1983 ENVIRONMENTAL ACCIDENT STATISTICS

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### INTRODUCTION

An environmental accident is defined as any accidental discharge of a material which could be harmful to the public or the environment. These accidents can result from a number of circumstances such as pipeline or storage tank leaks, transport accidents, fires involving chemicals or errors in product handling. Since some accidents cannot be prevented, prompt response is essential to limit adverse effects to the public and the environment.

The Province of Manitoba Emergency Plan identifies the Department of Environment and Workplace Safety and Health as the key provincial department for dangerous goods emergencies. To provide the required response, the Department has an environmental emergency response team, which provides 24-hour a day response to environmental accidents in Manitoba. In some cases, the team provides a direct on-site response or, in accordance with a departmental contingency plan, on-site services may be provided by the provincial public health inspectors who are part of the Environmental Management Division. The Workplace Safety and Health Division has personnel on stand-by for incidents involving worker safety concerns and the Air Standards and Studies Section maintains the Mobile Monitoring Unit which can be called out to provide on-site monitoring and analytical services at the scene of an accident.

The prime functions of the environmental emergency response team include assessing potential hazards to public health and safety and the environment from dangerous goods incidents, advising local officials of these hazards, ensuring that prompt and effective clean-up and restoration action is taken, ensuring proper disposal of contaminated material and providing technical advice to industry. To ensure that these responsibilities are carried out in an effective and co-ordinated manner, the environmental emergency team works closely

with the Manitoba Emergency Measures Organization, federal, provincial and municipal government departments, fire and police departments and industry.

The department maintains a 24-hour telephone number for receiving reports of environmental accidents. During 1983, the total number of calls received through the emergency reporting system increased to 273 from 262 in 1982. The actual number of chemical and petroleum spills decreased from 167 to 162 in the same time period. The only major variations in the annual statistics were an increase in the number of enquiries and complaints received from the public and an increase in the number of reports received through the Department's 24-hour reporting number. This indicates that the reporting number, which was established in 1981, is becoming more widely recognized.

1983 REPORTING STATISTICS

TYPES OF REPORTS RECEIVED

|                     | <u>1983</u> | <u>1982</u> |
|---------------------|-------------|-------------|
| PETROLEUM INCIDENTS | 90          | 99          |
| CHEMICAL INCIDENTS  | <u>72</u>   | <u>68</u>   |
|                     | 162         | 167         |

NON-EMERGENCIES

|                                           | <u>1983</u> | <u>1982</u> |
|-------------------------------------------|-------------|-------------|
| Industry Reports of Non-Routine Emissions | 47          | 48          |
| Odour Complaints                          | 5           | 19          |
| Food Inspector Requests                   | 8           | 3           |
| Minor Incidents and Precautions           | 18          | 17          |
| Other Complaints                          | 15          | 2           |
| Other Enquiries                           | <u>18</u>   | <u>6</u>    |
|                                           | 111         | 95          |

REPORTS ORIGINATING FROM:

|                                 |          |
|---------------------------------|----------|
| Industry                        | 124      |
| Police                          | 19       |
| Fire Department                 | 55       |
| Health Inspector                | 1        |
| Public                          | 32       |
| Federal/Provincial/State Agency | 28       |
| Local Authority                 | 5        |
| Union                           | 2        |
| Other                           | <u>7</u> |
|                                 | 273      |

REPORTS RECIVED BY:

|                                      |          |
|--------------------------------------|----------|
| "944-4888" Emergency Line            | 209      |
| Environmental Management Head Office | 36       |
| Emergency Measures Organization      | 11       |
| Public Health Inspector              | 6        |
| Environment Canada                   | 4        |
| Canutec                              | 4        |
| Community Relations                  | 1        |
| Other                                | <u>2</u> |
|                                      | 273      |

Total Reports in 1982 - 262

COMMENTS

1. The number of calls on the environmental emergency line increased from 176 in 1982 to 209 in 1983. The emergency line is becoming more widely used for reporting environmental incidents and the number of reports received through the Environmental Management Division head office number has decreased.
2. Of the 32 calls received from the public, 25 were received through the emergency number and 22 involved complaints or enquiries where an emergency response was not required.

RESPONSE PROCEDURES

| <u>On-Site Response Agency</u>        | <u>No. of Incidents</u> |
|---------------------------------------|-------------------------|
| Environmental Emergency Response Team | 58                      |
| Public Health Inspector               | 17                      |
| Workplace Safety and Health           | 10                      |
| Environment Canada                    | 6                       |
| Manitoba Cancer Foundation            | 3                       |
| Others                                | 1                       |
| No On-Site Response Required          | 77                      |

COMMENTS

1. For some incidents more than one agency provided an on-site response. In the above table, these incidents are counted beside each responding agency.
2. The Manitoba Cancer Treatment and Research Foundation responds to incidents involving radioactive materials in accordance with a contingency plan developed by the Foundation and the Environmental Management Division.

PETROLEUM SPILLS  
(1982 figures in brackets)

| Category      | Number of Incidents | Total Loss (Litres)    | Average Loss<br>Litres/Incident) |
|---------------|---------------------|------------------------|----------------------------------|
| Transfer      | 26 (34)             | 38703 (45789)          | 1488 (1347)                      |
| Transport     | 8 (8)               | 140200 (42962)         | 17525 (9825)                     |
| Eqpt. Failure | 29 (25)             | 166620 (101005)        | 5745 (4040)                      |
| Vandalism     | 5 (4)               | 6100 (1822)            | 1220 (455)                       |
| Miscellaneous | 22 (28)             | 22590 (52600)          | 1027 (1058)                      |
| <b>TOTAL</b>  | <b>90 (99)</b>      | <b>374213 (256832)</b> | <b>4158 (2594)</b>               |

**COMMENTS**

1. The transfer spills included 9 overfills of service station and bulk plant tanks. This is a decrease of more than 50% from the number of reported overfills in 1982. These 9 spills accounted for more than 50% of the product loss in this category. The remaining spills resulted from broken hoses and hose connections and overfilled tank truck compartments. The only major exception was a 12,600 litre diesel fuel spill which occurred when product was inadvertently transferred from a bulk tank through an improperly capped line.
2. Two of the transport spills involved fires which destroyed the trucks and burned most of the product involved. Four incidents involved truck overturns, one was a derailment and one was an aircraft which crashed with a cargo of diesel fuel. Poor driving conditions were a factor in only one of the four overturns.
3. Two of the spills in the equipment failure category involved pipe breaks at the St. Boniface refinery during the change over to a bulk products terminal. These two incidents, involving an estimated total of 96,000 litres of product, were contained and recovered on plant property before any significant contamination occurred. Approximately half of the spills in this category resulted from leaks in heating oil tanks and associated lines.

4. Half of the miscellaneous spills resulted from vehicle accidents where fuel tanks were damaged. Average fuel loss for these incidents was approximately 100 litres. The only large incident (10,200 litres) in this category occurred when a water draw-off valve was inadvertently left open on a bulk tank.

CHEMICAL INCIDENTS - 1983  
(1982 Figures in Brackets)

| <u>Category</u>   | <u>Number of Incidents</u> |             |
|-------------------|----------------------------|-------------|
| Transport         | 21                         | (15)        |
| Equipment Failure | 28                         | (30)        |
| Vandalism         | 1                          | (0)         |
| Fire              | 2                          | (7)         |
| Dumping           | 3                          | (1)         |
| Miscellaneous     | <u>17</u>                  | <u>(15)</u> |
|                   | 72                         | (68)        |

PRODUCTS INVOLVED IN 1983 INCIDENTS

|                          |           |
|--------------------------|-----------|
| Anhydrous Ammonia        | 8         |
| Refrigerant Gas          | 4         |
| Propane                  | 4         |
| Fertilizer               | 6         |
| PCB                      | 7         |
| Pesticides               | 6         |
| Radioactive Material     | 5         |
| Acids                    | 2         |
| Non-PCB Dielectric Fluid | 5         |
| Others                   | <u>25</u> |
|                          | 72        |

COMMENTS

1. The transport incidents included 9 leaking containers in truck, rail and air shipments, 6 valve leaks on tank cars or tank trucks and 5 overturned trucks or rail cars. The remainder involved containers falling off trucks, and vehicles and containers damaged in accidents.
2. The equipment failure incidents included damaged refrigerant lines, broken supply hoses and fittings, and leaks from chemical storage containers. All of the PCB and refrigerant gas releases fell into this category.
3. Twenty one of the chemical incidents occurred inside commercial buildings or private residences. Another twenty one were contained on the property of the company responsible for the material at the time of the incident.

4. The total quantity of PCB oil spilled in the seven incidents was less than 45 litres. Virtually all of this material was recovered and has been packaged and stored for eventual disposal.

#### DISCUSSION

The 1983 statistics suggest that the annual number of reported environmental accidents has reached a plateau and future numbers are expected to remain in the range of 150 to 170 incidents per year. This total will be affected by variables such as changes in industrial and agricultural practices, new industry programs for training personnel and upgrading equipment and changes in legislation.

It should be noted that of the 162 reported environmental accidents, 23 were considered to be major incidents. While there is no standard definition of a major incident, the factors which are considered include the volume and type of material released and the immediate and long term hazards to public health and the environment. The 77 incidents where no on-site response was provided were normally of a very minor nature or involved releases to atmosphere which had dissipated before a report was received. When any report is received, the Emergency Response Team assesses the site-specific aspects of the incident and initiates an appropriate response.

In addition to the actual spills or leaks that were reported, 111 non-emergency calls were received, primarily on the emergency line. Over 80 of these calls had no direct relevance to the environmental accident program. These calls came in on the emergency line primarily because this is the only number which provides 24 hour access to the Environmental Management Division line. The increase in complaints and enquiries suggests that the public is using the emergency line because of its accessibility.

The number of petroleum spills attributed to human error continued to drop in 1983. The major indicator of this trend is the number of storage tank overfills, which is down 50% from the 1982 figure. One of the reasons for this decrease is the continuing effort to train drivers and agents on proper petroleum handling procedures.

Also, the Environmental Management Division began issuing more warning tickets and summonses to persons responsible for petroleum spills in 1983, and this may have served as a deterrent.

A significant number of fuel oil spills occurred at schools, nursing stations and other institutional structures in Northern Manitoba. These spills are of particular concern since they often affect surface water which is used for drinking water supplies and for commercial and sport fishing. Due to the remote locations of these communities, clean-up equipment and expertise may not be readily available. Since most of the spills resulted from leaking tanks and piping, inadequate maintenance of these storage tank systems is quite likely a factor.

Two of the incidents which had the greatest potential for environmental contamination involved overturned petroleum tank trucks. Both of these incidents were attributed primarily to driver error. Three of the four overturns occurred during the summer and early fall, in daylight hours with good road conditions. This fact does not support the contention that more truck accidents can be expected during winter months when road conditions have deteriorated.

The chemical incidents which caused the greatest concern in 1983 were both acid spills from large industrial storage tanks. In both cases the spilled product was contained on plant property and neutralized. The major hazard involved was to the workers who were involved in the clean-up. Some questions were raised on the hazard of fumes drifting into an adjacent residential area during a hydrochloric acid spill. These incidents pointed out the need for containment dikes around acid storage tanks.

Several of the spills which occurred in 1983 resulted in localized environmental contamination. A number of petroleum spill clean-ups initiated in 1983 have been suspended for the winter months and further clean-up work will be done in the spring of 1984, if required.

CONCLUSIONS

- The number of reported incidents in 1984 is expected to remain close to the 1982 and 1983 levels. The reporting level could increase when mandatory reporting requirements in the pending dangerous goods legislation are implemented.
- Improved maintenance procedures for heating oil tanks, particularly at institutional buildings in Northern Manitoba, could reduce the number of spills resulting from equipment failure.
- Oil spill clean-up in remote communities could be carried out more effectively if local personnel were provided with more spill response training and access to clean-up equipment.
- The hazards presented by spills from bulk liquid storage tanks can be reduced significantly if all such tanks are surrounded by containment dikes. This would include liquid fertilizer and acid storage tanks.
- The number of non-emergency calls received on the emergency number could be reduced if a separate public complaint/enquiry line were to be established.

**POOR**

**QUALITY**

**ORIGINAL**

